



Syddansk Universitet

Harvest strategy for aerial parts affects the content of alkaloids in roots of *Echinacea purpurea*

Thomsen, Maria Obel ; Christensen, Lars Porskjær ; Grevsen, Kai

Publication date:
2011

Document Version
Final published version

[Link to publication](#)

Citation for published version (APA):

Thomsen, M. O., Christensen, L. P., & Grevsen, K. (2011). Harvest strategy for aerial parts affects the content of alkaloids in roots of *Echinacea purpurea*. Abstract from The International Symposium on Medicinal and Aromatic Plants, Chiang Mai, Thailand.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Harvest Strategy for Aerial Parts Affects the Content of Alkamides in Roots of *Echinacea purpurea*

M. O. Thomsen¹, L. P. Christensen², and K. Grevsen¹

¹ Department of Food Science, Faculty of Science and Technology, Aarhus University, Kirstinebjergvej 10, DK-5792 Aarslev, Denmark.

² Institute of Chemical Engineering, Biotechnology and Environmental Technology, Faculty of Engineering, University of Southern Denmark, Niels Bohrs Allé 1, DK-5230 Odense, Denmark.

Keywords: *Echinacea purpurea*, immune system, chromatography electrospray

Abstract

Echinacea purpurea are widely used for the unspecific enhancement of the immune system. The plant originates from North America and is now grown all over the world as garden flower and/or as a medicinal plant. Alkamides are believed to be among the active metabolites in *E. purpurea*, with the highest concentrations being present in the roots. Most investigations on roots have been conducted, on plants younger than one or two growing seasons and the effect of harvest of the aerial parts (herbal harvest) on the content of alkamides in roots of *E. purpurea* have, to the best of our knowledge, not been investigated before. Aerial parts (top 20 cm with flowers, stem and leaves) of 4-year old *E. purpurea* plants were harvested before, under and after flowering. Roots were then harvested one week, three weeks and three months after herbal harvest, respectively. Alkamides were extracted from milled freeze dried roots with ethanol–water (70:30) and identified by liquid chromatography electrospray ionization ion-trap mass spectrometry (LC–ESI–IT–MS/MS) combined with photodiode array detection (PAD) and quantified in extracts by reverse phase HPLC–PAD. Major alkamides in roots were identified as undeca-2Z,4E-diene-8,10-diynoic acid isobutylamide, dodeca-2E,4E,8Z,10Z-tetraenoic acid isobutylamide and dodeca-2E,4E,8Z,10E-tetraenoic acid isobutylamide. The results show that later harvest of aerial parts (harvest after flowering) results in an overall higher concentration of alkamides in roots compared to early harvest of aerial parts (harvest before flowering). Moreover, the concentration of alkamides in roots of *E. purpurea* is highest shortly after harvest of aerial parts, and the alkamide concentration is hereafter decreasing with time. In order to acquire highest content of alkamides in roots, harvest of aerial parts should be done after flowering and the roots should be harvested shortly afterwards.



THE INTERNATIONAL SYMPOSIUM ON MEDICINAL AND AROMATIC PLANTS



DECEMBER 15 – 18, 2011
THE EMPRESS HOTEL
CHIANG MAI, THAILAND

THE INTERNATIONAL SYMPOSIUM ON MEDICINAL AND AROMATIC PLANTS

ORGANIZED BY

**DEPARTMENT OF AGRICULTURE
HORTICULTURAL SCIENCE SOCIETY OF THAILAND
INTERNATIONAL SOCIETY FOR HORTICULTURAL SCIENCE**

EXECUTIVES

Director General of Department of Agriculture
President of Horticultural Science Society of Thailand
President of International Society of Horticultural Science
Director of Horticulture Research Institute, Department of Agriculture

EDITOR

Dr. Narong Chomchalow	Horticultural Science Society of Thailand
Mr. Virach Chantrasmi	Horticultural Science Society of Thailand

CONVENOR

Mr. Jirakorn Kosaisawe	Director General, Department of Agriculture,
------------------------	--

SECRETARY

Ms. Peyanoot Naka,	Horticulture Research Institute, Department of Agriculture
--------------------	--

ADDRESS

Horticulture Research Institute, Department of Agriculture, Chatuchak,
Bangkok 10900, Thailand.
Tel: 66-2579-8553, 66-2940-5484-5
Fax: 66-2561-4667
E-mail: peyanoot@hotmail.com
royalflorasymposium2011@yahoo.com
www.royalflora2011.com